Remarks/Arguments

Reconsideration of this application is suggested.

Extension of Time

A request for a one month extension of the period for response to the Office Action mailed on December 10, 2008 is enclosed. The extended period for response expires on April 10, 2009.

Claim Status

Claims 1-7, 9-12 and 15-28 are pending. Claims 1, 3, 6 and 26-28 are amended.

Telephone Interview Summary

A telephone interview was conducted in this application on March 10, 2009 between the Examiner and applicant's representative Robert Wu. Applicant thanks the Examiner for the courtesies extended during that interview.

The reference Hoshino was discussed during the interview. The Examiner indicated that Hoshino would be overcome by amending the claims to clarify the term "regenerative mode" to "current generating mode". The amendments to the independent claims, discussed below, are therefore intended to distinguish over Hoshino in this manner.

Claim Rejections – 35 USC 103(a)

Claims 1-7, 9, 11, 12, 15 and 18-28 are rejected under 35 USC 103(a) as obvious over Hoshino (US 2004/0244771). In response, applicant traverses the rejections and amends independent claims 1, 3, 6 and 26-28 to clarify the claimed subject matter.

The present invention, as recited in amended claims 1, 3, 6 and 26-28, provides the novel feature that when a control section has a failure, the control section shifts the electric motor to a current generating mode (regenerative mode) to control rotation of the throttle valve. As disclosed in applicant's specification at paragraph 0041, a regenerative mode is defined as the state of a control circuit when electric motor 20 serves as an electric generator. A torque in a direction

opposite to the rotating direction of electric motor 20 is generated in this mode and serves as a brake for reducing rotation of electric motor 20. Therefore, current is generated in the regenerative mode during a failure in the throttle valve control system. In this manner, rapid rotation of the throttle valve is prevented without the need for additional parts or housing space (paragraph 0042). Hoshino fails to disclose or suggest this feature.

In paragraph 0040 of Hoshino, a spring 34 is attached to a throttle valve to restore the throttle valve to a set position. Spring 34 functions as a failsafe mechanism for the throttle valve system such that when the throttle valve system fails, the throttle valve is kept open long enough by spring 34 for an engine to provide power until an operator can move a vehicle to safety. Similarly, paragraph 0051 teaches two springs 34 that act as a failsafe mechanism to keep a valve open at a set position in order to prevent engine stall. It is clear that springs 34 are the failsafe mechanisms for preventing a throttle valve from closing during a system failure.

Importantly, Hoshino teaches that when ECU 15 detects an abnormality (i.e., failure), motor driving circuit 35 is turned off (paragraph 0040). However, if motor driving circuit 35 is turned off, then circuit 35 would be unable to shift into a different mode using an H-Bridge circuit (FIG. 9). Therefore, the failsafe mechanism to control a throttle valve closing is provided only with springs 34 and is not implemented in Hoshino by an H-Bridge circuit. Applicant notes that paragraph 0051 merely teaches that a power source is turned off, without specifying which components lose power. However, paragraph 0040 makes clear that power is cut off to both motor driving circuit 35 and motor 33 such that a switch to a current generating mode is not possible in Hoshino after a failure is detected. At best, the H-Bridge circuit of Hoshino operates until a failure is detected, at which point power is cut off. Without any power available to motor driving circuit 35, a change to a current generating mode is not possible.

Moreover, applicant submits that the present invention operates contrary to accepted wisdom and demonstrates non-obviousness for this additional reason. In conventional solutions, upon a control system failure, one of ordinary skill will typically abandon control of the failed system and utilize a failsafe mechanism unassociated with the failed system. For example, Hoshino teaches that a failure detection results in power shut off of the throttle valve control system, including both circuitry 35 and motor 33. A passive spring failsafe mechanism is provided to compensate for the failed throttle valve control. This approach follows common sense where a failed control system is deactivated to allow a failsafe device to take over. Therefore, requiring a failed control system to also operate as a failsafe device is counter to the knowledge of those in the art and Hoshino. Thus, applicant's invention operates in a manner contrary to expectations and conventional wisdom and is further evidence of non-obviousness.

Since Hoshino does not disclose or suggest each and every feature of claims 1, 3, 6, and 26-28, those claims and claims 2, 4, 5, 7, 9, 11, 12 and 18-25 dependent thereon are not obvious over Hoshino. The rejections under 35 USC 103(a) should therefore be withdrawn.

Conclusion

This application is now believed to be in condition for allowance. The Examiner is invited to contact the undersigned to resolve any issues that remain after entry of this amendment.

Any fees due with this response may be charged to our Deposit Account No. 50-1314.

Respectfully submitted,
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